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December
2016

Dual Enrollment in Maryland: A Report to the Maryland General Assembly and Governor Larry Hogan

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Suggested Citation

Henneberger, A.K., Cohen, M.K., Shipe, S.L., & Shaw, T.V. (2016). *Dual Enrollment in Maryland: A Report to the Maryland General Assembly and Governor Larry Hogan*. Baltimore, MD: Maryland Longitudinal Data System Center.

Acknowledgement

This report was prepared by the Research Branch of the Maryland Longitudinal Data System Center (MLDSC). The Research Branch would like to thank the entire staff of the MLDSC for their assistance with this report. We would also like to thank the Regional Educational Laboratory Mid-Atlantic for their assistance with this report.

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Executive Summary

This annual report on dually enrolled students is a requirement of the College and Career Readiness and College Completion Act (CCR-CCA) of 2013. It is submitted to the Governor and the General Assembly by the Maryland Longitudinal Data System Center (MLDSC) as set forth in Education Article §24-703.1, Annotated Code of Maryland. As defined in Education Article §18-14A-01, Annotated Code of Maryland, a dually enrolled student is a student who is enrolled in both a secondary school (high school) and an institution of higher education (college) in Maryland. This report examined the rates and trends in dual enrollment, the courses in which students were dually enrolled, and the college enrollment outcomes of dually enrolled students in Maryland.

Data from the Maryland Longitudinal Data System (MLDS) were used to identify students who (1) had overlapping enrollment dates in a Maryland public high school and a Maryland college and (2) were enrolled in the college for at least 30 days. Course information for dually enrolled students was identified using the student, course, grade, teacher data file and the course catalog from the Maryland State Department of Education (MSDE). Each course was classified by the public school district using the School Courses for the Exchange of Data (SCED) classification system. College enrollment outcomes were examined by linking data from dually enrolled students to college enrollments one year later and two years later to examine retention in college.

The analyses of this report indicated a large increase in the number and percentage of students dually enrolled between 2013-2014 and 2014-2015. The majority of dually enrolled students were female, white, non-Hispanic, and not eligible for FARMs. The most popular SCED classification for courses taken by dually enrolled students was miscellaneous, which included independent study, career technical education (CTE)-career development, preparation, and transition, and study skills courses. Miscellaneous was followed by English language and literature, life and physical sciences, and mathematics. A larger percentage of dually enrolled 12th grade students enrolled in college within one academic year when compared to the percentage of the total 12th grade population enrolling in college within one academic year.

Future reporting on dual enrollment in Maryland will provide more detailed information on courses taken by dually enrolled students and the college outcomes associated with dual enrollment participation, including examination of the association between dual enrollment participation and college outcomes after controlling for student demographic characteristics and high school achievement. Overall, the findings of this report indicate a positive upward trend in the number and percentage of dually enrolled students in Maryland. The findings also highlight the importance of continued focus on getting students involved in dual enrollment, particularly students currently under-represented in the dually enrolled population, such as male students, minority students, and students eligible for FARMs.

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Introduction

The purpose of this report is to provide information about dually enrolled students. As defined in Education Article §18-14A-01, Annotated Code of Maryland, a dually enrolled student is a student who is enrolled in both a secondary school (high school) and an institution of higher education (college) in Maryland. There are a variety of ways in which high school students dually enroll in college courses, which may include students accessing college courses either in conjunction with a local high school or on their own. Courses for dually enrolled students can be taught on either the high school or college campus with faculty from the college or with specially credentialed high school teachers. This report is an annual requirement of the College and Career Readiness and College Completion Act (CCR-CCA) of 2013. It is submitted to the Governor and the General Assembly by the Maryland Longitudinal Data System Center (MLDSC) as set forth in Education Article §24-703.1, Annotated Code of Maryland.

This report begins with an overview of national and state-level research on dual enrollment rates and trends, an overview of state-level dual enrollment course information, and a brief overview of research on the outcomes associated with participation in dual enrollment. Next, using data from the Maryland Longitudinal Data System (MLDS), dual enrollment rates and trends, course information, and college enrollment outcomes in Maryland were examined. This dual enrollment report is the first to use data from the MLDS to report on the types of coursework taken by dually enrolled students. Finally, directions for future reporting on dual enrollment in Maryland are discussed.

Background

Dual Enrollment Rates and Trends

The most recent national statistics on high school students' dual enrollment were reported by the National Center for Education Statistics (NCES), which surveyed public high schools to gain information about student participation in dual credit courses in academic year 2010-2011 (Thomas, Marken, Gray, & Lewis, 2013). The results were based on a nationally representative survey of 1,500 public high schools with grades 11 or 12 in the 50 states and the District of Columbia. Dual credit courses were defined as courses where students could earn both high school and postsecondary credit at the same time and were classified into two groups: (1) those with an academic focus (for example, English, math, science, history, and foreign languages) and (2) those with a career and technical/vocational focus (for example, business, computer technology, automotive technology, and health care [Thomas et al., 2013]).

Eighty-two percent of high schools reported any students taking dual credit courses in the 2010-2011 academic year (Thomas et al., 2013). About three-quarters (76%) had students enrolled in dual credit courses with an academic focus and about half (49%) had students enrolled in dual credit courses with a vocational focus. Schools with 500 or more students were more likely to have students in dual credit courses of both types than schools with fewer than 500 students. Schools in towns and rural areas were more likely to have students taking

academic dual credit courses than schools in suburbs and cities. Schools in towns were considerably more likely to have students in vocational dual credit courses than schools in cities, suburbs, or rural areas. Schools in the Southeast and Central regions of the country were more likely to have students in dual credit academic courses than schools in the Northeast and Southeast, while the Central region led and the Northeast lagged in vocational course participation. Schools with higher percentages of minority students were less likely to have students taking dual credit academic courses than schools reporting lower percentages of minority students. The same relation existed for vocational courses, except that schools with 6 to 20% minority students were actually somewhat less likely to have students participating in dual credit courses than schools with less than 6% minority students.

The NCES also studied the prevalence and characteristics of dual enrollment programs at postsecondary institutions in the United States in academic year 2010-2011 (Marken, Gray, & Lewis, 2013). The results were based on a nationally representative survey of 1,650 public and private postsecondary institutions in the 50 states and the District of Columbia. Dual enrollment was defined as high school students earning college credits for courses taken through a postsecondary institution. Dual enrollment could occur through a dual enrollment program, which was defined as an organized system with special guidelines allowing high school students to take college courses. Alternatively, dual enrollment could also occur outside a dual enrollment program, which was defined as high school students simply enrolling in courses for college credit and being treated as regular college students.

Over half (53%) of postsecondary institutions reported any high school students taking courses for college credit either within or outside of an organized dual enrollment program (Marken et al., 2013). Forty-six percent reported students taking courses as part of an organized program, while 28% reported students taking courses for credit outside of a dual enrollment program. Institutions reported that approximately 1,227,100 high school students took courses for college credit within a dual enrollment program in the 2010-2011 academic year, with another 136,400 taking such courses on their own. Dual enrollment was most prevalent in public two-year colleges, 98% of which reported high school students taking college courses for credit, and public four-year colleges, where 84% reported high school students taking college courses for credit. Almost half (49%) of private nonprofit four-year colleges also reported high school students taking courses for credit, but only 10% of private for-profit colleges reported high school students taking courses for credit. Institutions with 3,000 or more students were much more likely to report high school students taking courses for credit than smaller institutions.

To provide percentages for comparison of Maryland to other states, dual enrollment data were compiled from states that had publically available information (see Table 1). Among the states examined, Iowa had the largest percentage of high school students dually enrolled (called "jointly enrolled" in Iowa), with about 30% of all public high school students and about 50% of high school seniors dually enrolled in community college credit coursework (Iowa Department of Education, n.d.). Washington also reported a large percentage (about 50%) of high school students dually enrolled, but Washington included Advanced Placement (AP) and International Baccalaureate (IB) course enrollments in the count of dual enrollment (State of Washington, n.d.).

Table 1. Dual Enrollment Findings (2014-2015) from States that Provide Public Information on Dual Enrollment

State	Year Reported	Definition of Dual Enrollment	Number and Percentage of Students Dually Enrolled and Student Demographic Characteristics
Colorado ^a	Academic Year 2014-2015	<ul style="list-style-type: none"> • Dual enrollment refers to a broad array of programs that allow high school students to take college-level courses for credit. • Concurrent enrollment is the “simultaneous enrollment of a qualified student in a local education provider and in one or more postsecondary courses, including academic or career and technical education courses, which may include course work related to apprenticeship programs or internship, at an institution of higher education (p. 6).” 	<ul style="list-style-type: none"> • $N = 35,713$ (nearly 30%) of all 11th and 12th grade public high school students were dually enrolled. • $N = 23,127$ students were concurrently enrolled. • 54% female; 55% white; 4% African American; 22% Hispanic
Illinois ^b	Fiscal Year 2015	<ul style="list-style-type: none"> • Dual enrollment includes students who were enrolled in high school and an Illinois community college. 	<ul style="list-style-type: none"> • $N = 51,718$ high school students were dually enrolled in Illinois community colleges. • 51% female; 71% white; 7% African American; 12% Latino
Iowa ^c	Fiscal Year 2015	<ul style="list-style-type: none"> • Jointly enrolled students are high school students enrolled in community college credit coursework. 	<ul style="list-style-type: none"> • $N = 44,034$ (28%) high school students were jointly enrolled in community colleges. • About half of all high school seniors were jointly enrolled. • 49% female; 14% Minority (Minority students included 18% Black and 46% Hispanic)
Minnesota ^d	Fiscal Year 2015	<ul style="list-style-type: none"> • The Postsecondary Enrollment Options (PSEO) program in Minnesota allows high school students to enroll in courses taught by college 	<ul style="list-style-type: none"> • $N = 7,768$ students were enrolled in the PSEO program. <ul style="list-style-type: none"> ○ 66% female; 22% eligible for free or

		<p>professors on college campuses.</p> <ul style="list-style-type: none"> • Concurrent enrollment serves high school students enrolled in a postsecondary course taught during the regular school day and offered through a partnership between a high school and a college or university. Qualified high school instructors or college faculty teach the courses, which are offered at the secondary school or another location. 	<p>reduced price meals (FARMs); 79% white; 7% Black; <1% Hispanic</p> <ul style="list-style-type: none"> • <i>N</i> = 27,298 students were concurrently enrolled. <ul style="list-style-type: none"> ○ 57% female; 18% eligible for FARMs; 87% white; 3% Black; 3% Hispanic
New Mexico ^e	Academic Year 2014-2015	<ul style="list-style-type: none"> • The dual credit program provides access to academic or career-technical course options that deliver simultaneous credit toward high school graduation and a postsecondary degree or certificate. 	<ul style="list-style-type: none"> • <i>N</i> = 17,331 students were in the dual credit program. • 54% female; 27% white; 1% Black; 47% Hispanic
Utah ^f	Academic Year 2014-2015	<ul style="list-style-type: none"> • The concurrent enrollment program makes college courses available to high school students for both high school and college credit. Courses are taught either at the high school or at a college site. 	<ul style="list-style-type: none"> • <i>N</i> = 28,551 students were in the concurrent enrollment program. • 54% female; 85% white; <1% Black; 9% Hispanic
Washington ^g	Academic Year 2014-2015	<ul style="list-style-type: none"> • Dual credit programs allow students to take rigorous college-level courses while still in high school. Dual credit programs include Advanced Placement (AP), International Baccalaureate (IB), and a number of specialized programs allowing dual credit through college course enrollment. 	<ul style="list-style-type: none"> • <i>N</i> = 190,306 (47%) students in grades 9-12 were in dual credit programs (includes AP and IB). • 50% female; 8% eligible for FARMs; 61% white; 5% Black; 17% Hispanic
<p>Notes. ^aColorado Department of Higher Education (2016); ^bIllinois Community College Board (2016); ^cIowa Department of Education (n.d.); ^dMinnesota Department of Education (2016); ^eNew Mexico Public Education Department (2015); ^fUtah State Office of Education (2015); ^gState of Washington (n.d.). States without percentages listed did not provide enough information to calculate percentages.</p>			

Dual Enrollment Course Information

Among the states examined in Table 1, three states (Illinois, Iowa, and New Mexico) provided information on coursework taken by dually enrolled students in 2014-2015 (see Table 2 for a summary of coursework information). Among two of the states—Iowa and New Mexico—the most popular subject area in which dual enrollment coursework was taken was English language and literature (Iowa Department of Education, n.d.; New Mexico Public Education Department, 2015). In Illinois, the most popular subject area in which dual enrollment coursework was taken was writing (Illinois Community College Board, 2016). Iowa and New Mexico also reported on credit hours and number of courses taken, respectively. Iowa reported that dually enrolled students enrolled in an average of 8 credit hours at Iowa community colleges (Iowa Department of Education, n.d.). New Mexico reported that the majority (70%) of dually enrolled students took only one class per academic year (New Mexico Public Education Department, 2015).

State	Definition for Including Coursework	Most Popular Coursework
Illinois ^a	Coursework information was reported for dual credit enrollments in which both high school and college credits were earned.	<ol style="list-style-type: none"> 1. Writing 2. Mathematics 3. Spanish Language and Literature 4. Psychology 5. Rhetoric and Composition
Iowa ^b	Coursework information was reported for students jointly enrolled in community colleges through contracts with school districts and through state-approved enrollment in college coursework. Coursework information was not reported for students who enrolled in college independently and paid tuition.	<ol style="list-style-type: none"> 1. English Language and Literature 2. Social Sciences and History 3. Mathematics 4. Health Care Sciences 5. Engineering and Technology
New Mexico ^c	Coursework information was reported for dual credit courses in which college courses were taken for both high school and college credit.	<ol style="list-style-type: none"> 1. English Language and Literature 2. Visual and Performing Arts 3. Health Professions and Related Clinical Sciences 4. Mathematics and Statistics

Notes. ^aIllinois Community College Board (2016); ^bIowa Department of Education (n.d.); ^cNew Mexico Public Education Department (2015); Illinois and Iowa reported coursework for Fiscal Year 2015 and New Mexico reported coursework for academic year 2014-2015.

College Enrollment Outcomes

Participation in dual enrollment has been associated with a number of positive outcomes in college. For example, participation in dual enrollment in Florida and New York was associated with enrollment in college after high school, enrollment in a four-year institution, and pursuing a bachelor's degree (Karp, Calcagno, Hughes, Jeong, & Bailey, 2007). Additionally, dually enrolled students were more likely than non-dually enrolled students to persist in college past the first semester, earn more college credits after three years, and achieve higher college grade point averages (Karp et al., 2007). In a nationally representative sample of students, participation in dual enrollment was associated with increased likelihood of earning any college degree and an increased likelihood of earning a bachelor's degree (An, 2013).

The two studies reviewed above (An, 2013; Karp et al., 2007) used statistical methods that controlled for student demographic characteristics and high school achievement, factors that may be related to improved college outcomes over time. This enabled the authors to more accurately examine the true association between dual enrollment participation and college outcomes. However, any unmeasured variables that were not used as controls in the model, such as student motivation, may be contributing to the positive association between dual enrollment participation and college outcomes. Thus, although findings provide initial evidence for the positive outcomes associated with dual enrollment, findings should be interpreted with caution. More research is needed to examine dual enrollment participation after controlling for important differences between students who participate in dual enrollment and students who do not participate in dual enrollment.

Last year's dual enrollment report published by the MLDS was the first report to use data from the MLDS to examine the college enrollment outcomes for students dually enrolled in Maryland (Henneberger, Shaw, Uretsky, & Woolley, 2015). Ninety-one percent of Maryland's 12th grade dually enrolled students in academic year 2012-2013 enrolled in college in the following academic year. This percentage was larger than the percentage of the total Maryland 12th grade population enrolling in college in the following academic year (63%). These results do not control for important characteristics that may be related to college enrollment, such as demographic characteristics and students' high school achievement, and thus should be interpreted with caution.

Research Questions

This report answers the following statutorily mandated research questions, as defined in Education Article § 24-703.1, Annotated Code of Maryland:

- (1) How many Maryland students are dually enrolled in a Maryland public high school and a Maryland college by high school district?
- (2) What are the course names and numbers of students dually enrolled in a Maryland public high school and a Maryland college?

In addition, this report provides information to answer the following research questions:

- (3) What are the demographic characteristics of Maryland students who are dually enrolled in a Maryland public high school and a Maryland college?

- (4) What are the college enrollment outcomes of Maryland students who are dually enrolled in a Maryland public high school and a Maryland college?

Method

Data from the MLDS were used to identify students who (1) had overlapping enrollment dates in a Maryland public high school and a Maryland college and (2) were enrolled in the college for at least 30 days. Students who met these two criteria were classified as dually enrolled¹. The most recent data available in the MLDS at the time this report was written were for 2014-2015 enrollments in Maryland public high schools and Maryland colleges.

Course information for dually enrolled students was identified using the student, course, grade, teacher data file and the course catalog from the Maryland State Department of Education (MSDE)². Each public school district assigns course information for courses and identifies students taking the courses. To identify dual enrollment courses, we selected dually enrolled students who were in courses that met any of the following criteria: (1) the course grade level indicated college level coursework, (2) the course rigor level indicated college level coursework, (3) the course delivery method indicated postsecondary or university/college, or (4) the course was flagged as a dual enrollment course. A total of 9,058 Maryland public high school students were dually enrolled, and 29% ($N = 2,587$) of dually enrolled students had dual enrollment course information identified using this method. This method identified a total of 11,938 dual enrollment courses (students were counted multiple times if identified in more than one dual enrollment course).

Each course is classified using the School Courses for the Exchange of Data (SCED) classification system. There are 22 SCED subjects coded using five digits which identify the general description of the course and the grade level of the course³. This report presents the core academic subjects (English language and literature, mathematics, life and physical sciences, social sciences and history, fine and performing arts, foreign language and literature), physical, health, and safety education, and the miscellaneous⁴ categorization. The remaining SCED subjects⁵ were grouped together in the “other subject areas” category.

¹ Prior dual enrollment reports reported on the dual enrollment flag from the Maryland Higher Education Commission (MHEC) data. This method is no longer reported in detail because it uses data from only one of our partner agencies to identify dually enrolled students and relies on the postsecondary institution to correctly identify dually enrolled students. The number of dually enrolled students identified using the MHEC flag and the comparison to the number identified using the overlapping enrollments method is provided in Appendix A.

² One exception was the credit information, which was obtained from the Maryland Higher Education Commission (MHEC).

³ Please see Bradby, Pedroso, and Rogers (2007) and/or <http://nces.ed.gov/scedfinder/> for more information on the School Courses for the Exchange of Data (SCED) classification system.

⁴ Miscellaneous is a SCED classification assigned to the course by the school district. Examples of dual enrollment courses classified as miscellaneous included independent study, CTE-career development, preparation, and transition, and study skills.

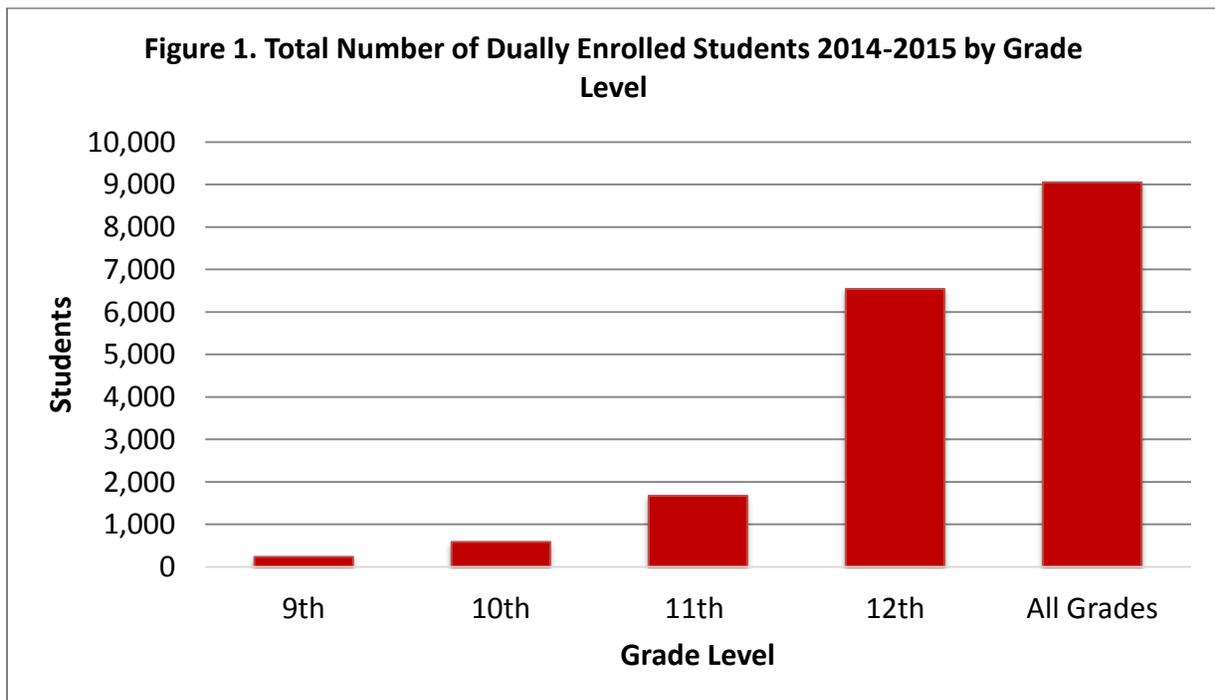
⁵ The “other SCED” category included: religious education and theology, military science, computer and information sciences, communications and audio/video technology, business and marketing, manufacturing, health care sciences, public, protective, and government service, hospitality and tourism, architecture and construction, agriculture, food, and natural resources, human services, transportation, distribution, and logistics, and engineering and technology.

College enrollment outcomes were examined for the 2013-2014 and 2012-2013 cohorts of 12th grade students. These cohorts were used in order to have enough years of data to examine the transition from 12th grade into college. We examined one year college enrollment outcomes for the 2013-2014 12th grade cohort, and we examined the two year college enrollment outcomes for the 2012-2013 12th grade cohort.

Findings

Dual Enrollment Rates and Trends

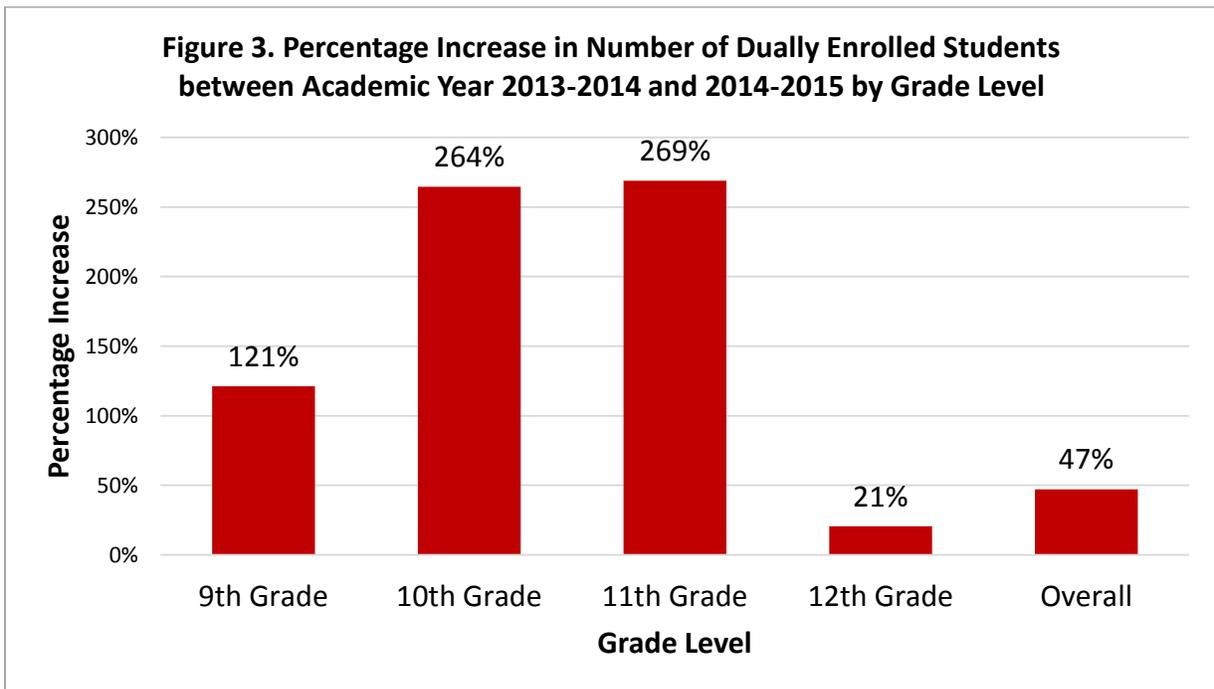
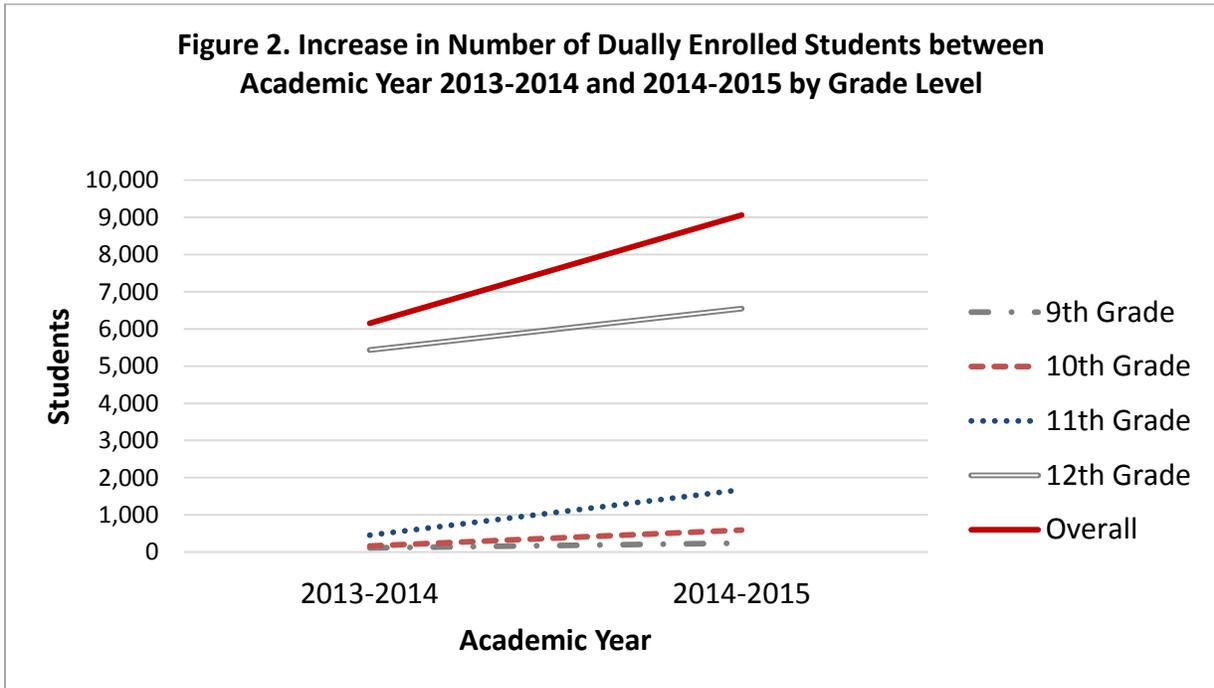
A total of 9,058 Maryland public high school students were dually enrolled in the 2014-2015 academic year (see Figure 1). Just over 6,500 of those dually enrolled students were 12th grade students. About 1,700 were 11th grade students, about 600 were 10th grade students, and about 250 were 9th grade students.



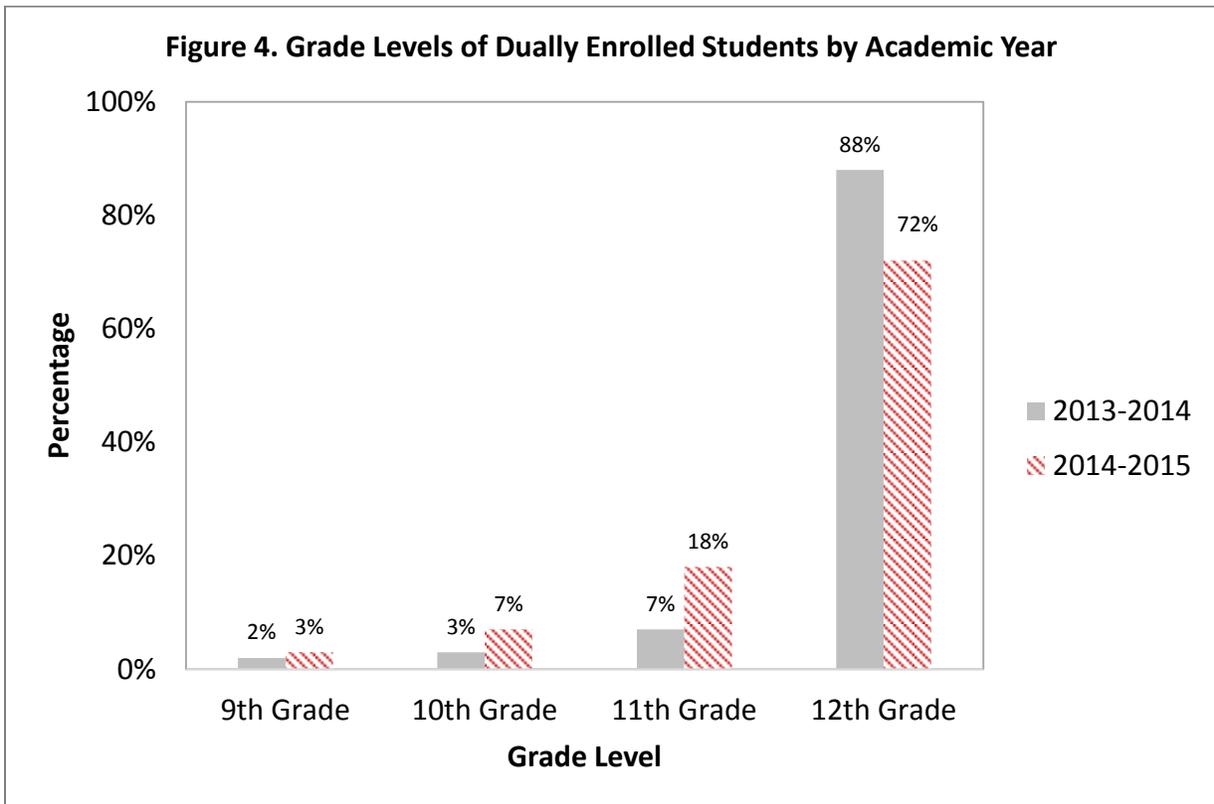
The total number of Maryland public high school students who were dually enrolled greatly increased from the 2013-2014 to the 2014-2015 academic year (see Figure 2). In 2013-2014, just over 6,000 Maryland public high school students were dually enrolled and in 2014-2015, just over 9,000 Maryland public high school students were dually enrolled. This increase in the number of students dually enrolled was seen for each of the grade levels.

Figure 3 displays the percentage increase in dual enrollment from the 2013-2014 to the 2014-2015 academic year by grade level. Overall, the number of dually enrolled students in 2014-2015 represented a 47% increase from 2013-2014. The largest percentage increase occurred for 10th and 11th grade dually enrolled students. The number of 11th grade dually enrolled students in 2014-2015 represented a 269% increase from 2013-2014. The number of

10th grade dually enrolled students in 2014-2015 represented a 264% increase from 2013-2014. The number of 9th grade dually enrolled students in 2014-2015 represented a 121% increase from 2013-2014. The smallest percentage increase occurred for 12th grade dually enrolled students. The number of 12th grade dually enrolled students in 2014-2015 represented a 21% increase from 2013-2014.



The majority of 2014-2015 dually enrolled students (72%) were 12th grade students (see Figure 4). However, the percentage of dually enrolled students who were 12th grade students in 2014-2015 (72%) was substantially lower than the percentage of dually enrolled students who were 12th grade students in 2013-2014 (88%). This is because the percentage of dually enrolled students in lower grades increased. For example, the percentage of dually enrolled students who were 11th grade students increased from 7% in 2013-2014 to 18% in 2014-2015 and the percentage of dually enrolled students who were 10th grade students increased from 3% in 2013-2014 to 7% in 2014-2015.

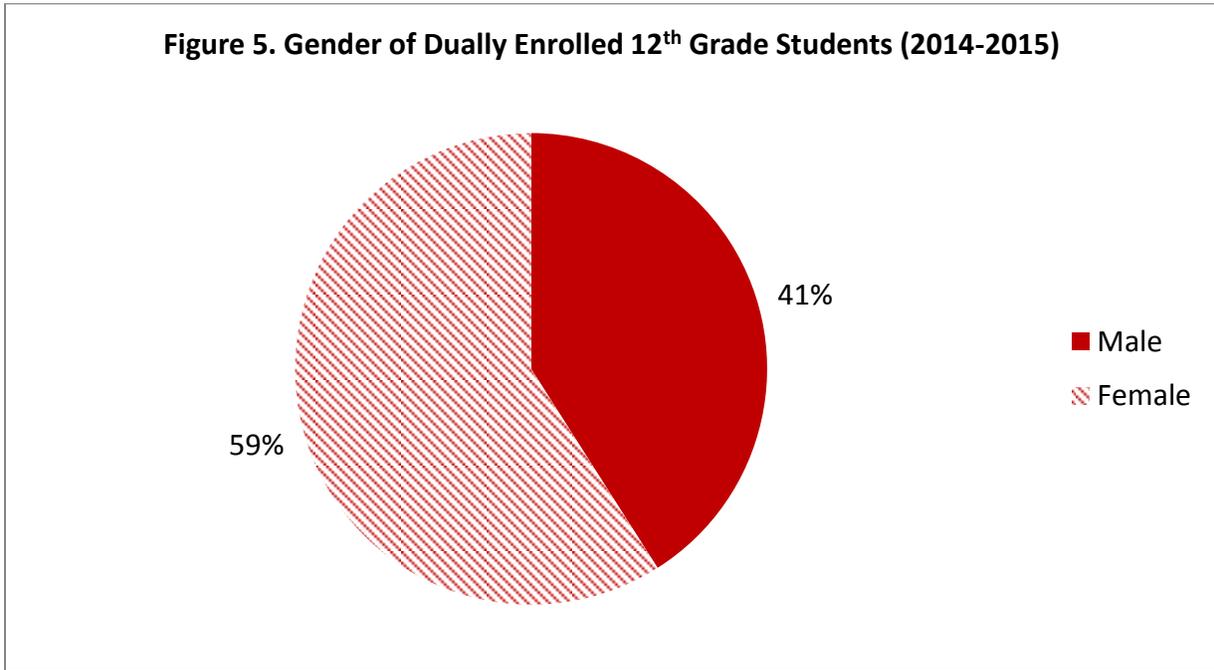


A total of 6,548 12th grade students were dually enrolled in academic year 2014-2015, which represented 11% of the total 12th grade Maryland public high school enrollment (see Table 3). The percentage of 12th grade students who were dually enrolled in 2014-2015 (11%) was higher than the percentage of 12th grade students who were dually enrolled in 2013-2014 (9%). The percentage of 12th grade students who were dually enrolled varied across high school districts, with a high of 30% in Washington County and a low of 2% in Baltimore City in the 2014-2015 academic year.

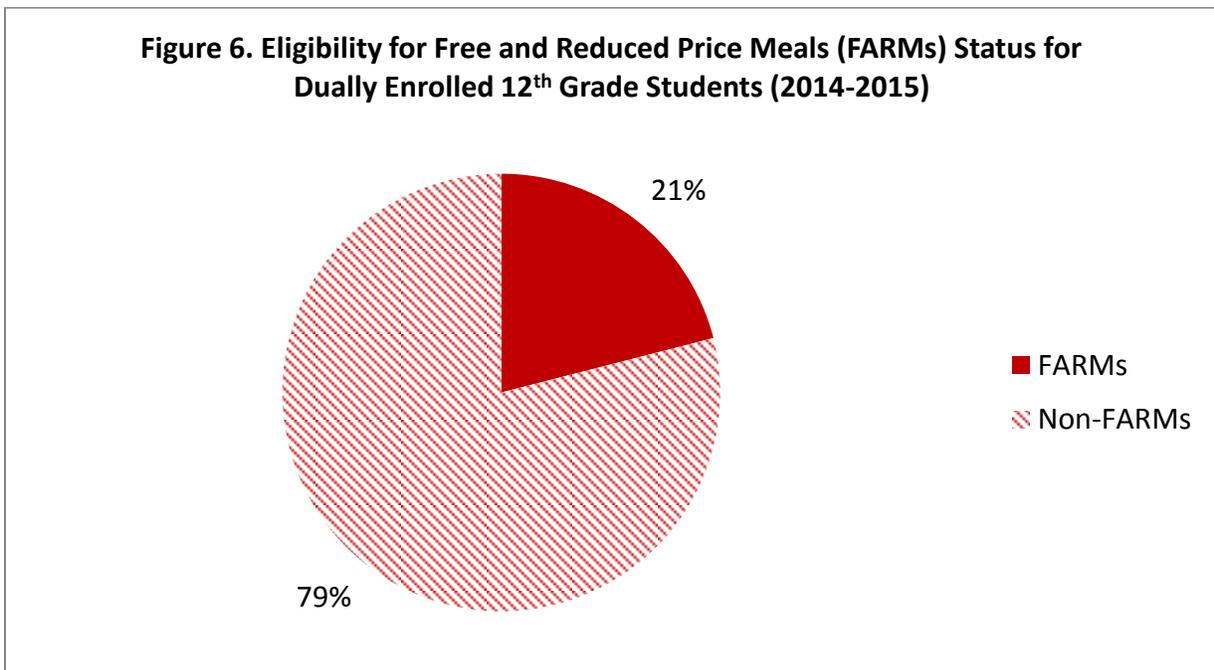
Table 3. Number and Percentage of Maryland 12th Grade Students Dually Enrolled by School District

	Total 12 th Grade Enrollment		Dually Enrolled		
	2014-2015		2014-2015		2013-2014
	N		N	%	%
Maryland	61,622	6,548	11	9	
District					
Allegany	685	156	23	13	
Anne Arundel	5,400	709	13	14	
Baltimore City	4,895	119	2	3	
Baltimore County	7,639	905	12	9	
Calvert	1,347	216	16	15	
Caroline	393	51	13	16	
Carroll	2,157	217	10	11	
Cecil	1,143	194	17	14	
Charles	2,215	171	8	4	
Dorchester	332	60	18	10	
Frederick	3,142	665	21	16	
Garrett	251	32	13	15	
Harford	2,826	445	16	15	
Howard	4,151	291	7	6	
Kent	170	31	18	16	
Montgomery	10,949	697	6	5	
Prince George's	8,314	501	6	3	
Queen Anne's	606	96	16	14	
Somerset	175	34	19	8	
St. Mary's	1,294	172	13	13	
Talbot	298	50	17	19	
Washington	1,727	515	30	28	
Wicomico	992	128	13	11	
Worcester	521	93	18	16	

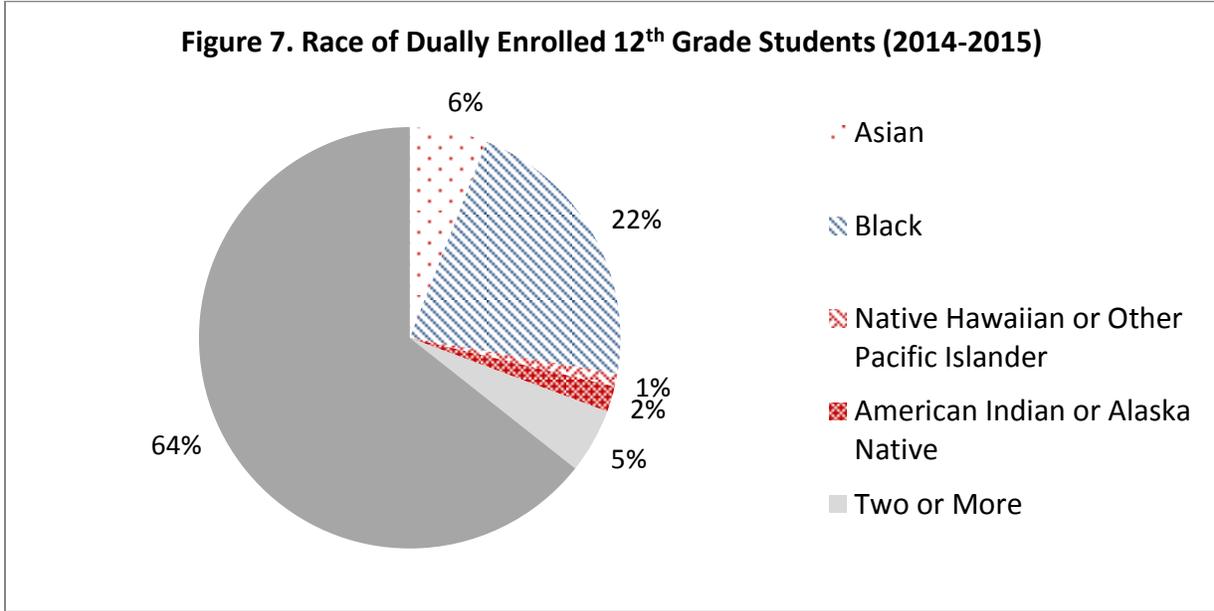
The majority (59%) of dually enrolled 12th grade students in academic year 2014-2015 were female (see Figure 5). Forty-one percent of dually enrolled 12th grade students were male.



The majority (79%) of dually enrolled 12th grade students in academic year 2014-2015 were not eligible for free and reduced price meals (FARMs; see Figure 6). Twenty-one percent of dually enrolled 12th grade students were eligible for FARMs. FARMs was used as a proxy for socio-economic status (SES).



The majority (64%) of dually enrolled 12th grade students in academic year 2014-2015 were white (see Figure 7). Twenty-two percent of dually enrolled 12th grade students were Black, 6% were Asian, 5% were two or more races, 2% were American Indian or Alaska Native, and less than 1% were Native Hawaiian or Other Pacific Islander.



The majority (93%) of dually enrolled 12th grade students in academic year 2014-2015 were Non-Hispanic and 7% were Hispanic (see Figure 8).

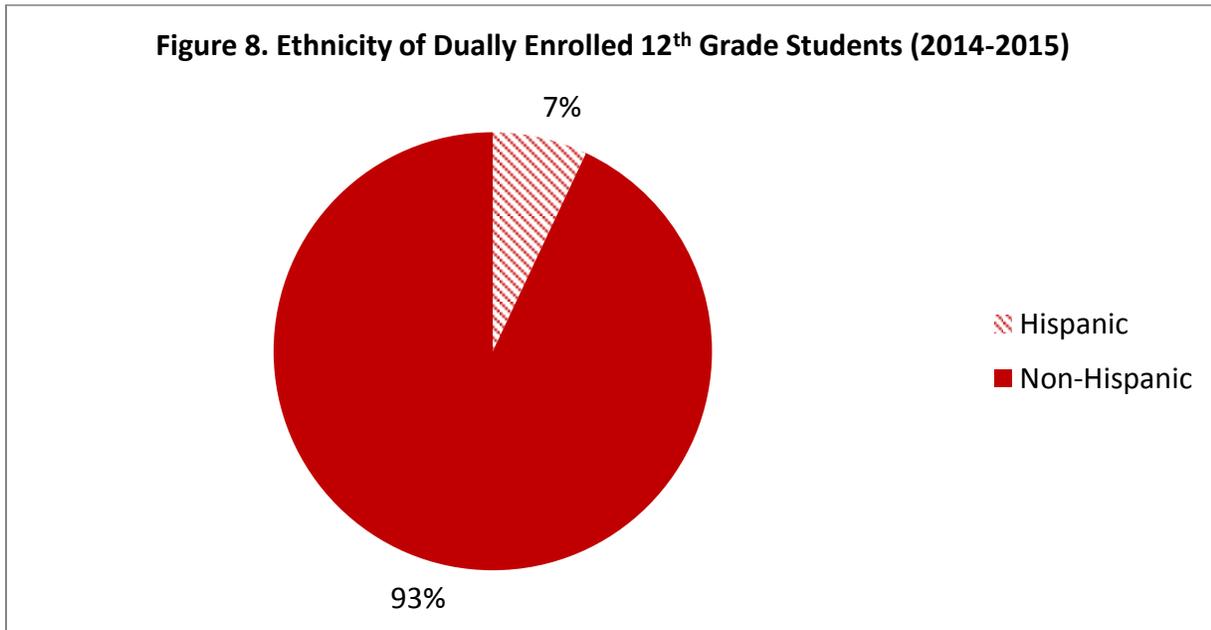


Table 4 shows the distribution of the characteristics of the Maryland 12th grade population in comparison to the 12th grade dually enrolled population to examine whether certain subgroups of students are over- or under-represented in the 12th grade dual enrollment population. In the 2014-2015 academic year, female students were over-represented in the 12th grade dually enrolled population (59%) when compared to the total 12th grade population (50%). Students eligible for FARMs were under-represented in the 12th grade dually enrolled population (21%) when compared to the total 12th grade population (34%). White students were over-represented in the 12th grade dually enrolled population (65%) when compared to the total 12th grade population (49%). Hispanic students were under-represented in the 12th grade dually enrolled population (7%) when compared to the total 12th grade population (11%).

Table 4 also shows the distribution of the characteristics of the Maryland 12th grade population in comparison to the Maryland 12th grade dually enrolled population by year to examine the change in the demographic distributions over time. The percentage of dually enrolled students who were eligible for FARMs increased from 18% in 2013-2014 to 21% in 2014-2015. The percentage of dually enrolled students who were Black increased from 18% in 2013-2014 to 22% in 2014-2015. The percentage of dually enrolled students who were Hispanic increased from 5% in 2013-2014 to 7% in 2014-2015.

Table 4. Demographic Characteristics of Dually Enrolled 12th Grade Students Compared to the 12th Grade Student Population Across Academic Years

	2013-2014		2014-2015	
	Total 12 th	Dually Enrolled 12 th	Total 12 th	Dually Enrolled 12 th
	%	%	%	%
Gender				
Female	50	60	50	59
Male	50	40	50	41
Free and Reduced Price Meals (FARMs)				
FARMs	33	18	34	21
Non-FARMs	67	82	66	79
Race				
Asian	6	5	6	6
Black	36	18	36	22
Native Hawaiian or Other Pacific Islander	<1	<1	<1	<1
American Indian or Alaska Native	3	1	3	2
Two or More	6	4	6	5
White	49	71	49	65
Ethnicity				
Hispanic	10	5	11	7
Non-Hispanic	90	95	89	93
<i>Note. Percentages may not add to 100 due to rounding.</i>				

Figure 9 shows the postsecondary institution type where 12th grade students were dually enrolled in academic year 2014-2015. The majority of 12th grade students (91%) were dually enrolled at 2-year public institutions. The remaining students were dually enrolled at 4-year public institutions (7%) and 4-year private institutions (2%).

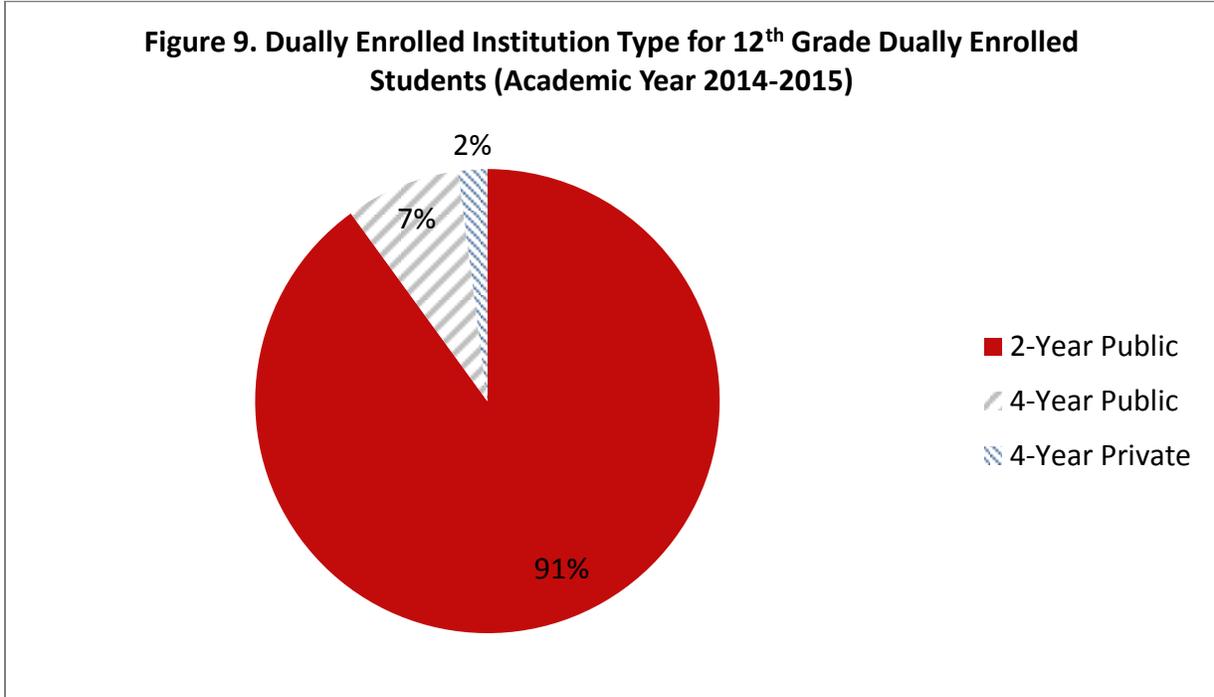


Table 5 displays the number of dually enrolled 12th grade students by college for students who attended a 2-year public institution in academic year 2014-2015. The largest number of dually enrolled 12th grade students ($N = 869$) attended the Community College of Baltimore County (CCBC). CCBC was followed by Anne Arundel Community College ($N = 685$), Montgomery College ($N = 635$), Frederick Community College ($N = 633$), College of Southern Maryland ($N = 531$), and Hagerstown Community College ($N = 514$).

Table 6 displays the number of dually enrolled 12th grade students by college for students who attended a 4-year public institution in academic year 2014-2015. The largest number of dually enrolled 12th grade students ($N = 72$) attended Bowie State University, followed very closely by Frostburg State University ($N = 71$). The University of Maryland Baltimore County ($N = 69$) and the University of Maryland College Park ($N = 61$) also had relatively high numbers of students dually enrolled, when compared to the other 4-year public institutions.

The number of dually enrolled 12th grade students who were dually enrolled in 4-year private institutions was too small to report by institution. Of the 4-year private institutions, Stevenson University had the largest number of 12th grade students dually enrolled ($N = 45$).

Table 5. Number of Dually Enrolled 12th Grade Students by College Dually Enrolled for 2-Year Public Institutions (Academic Year 2014-2015)

2-Year Public Institution	Dually Enrolled 12 th Grade Students <i>N</i>
Allegany College of Maryland	127
Anne Arundel Community College	685
Baltimore City Community College	40
Carroll Community College	197
Cecil Community College	186
Chesapeake College	244
College of Southern Maryland	531
Community College of Baltimore County	869
Frederick Community College	633
Garrett College	32
Hagerstown Community College	514
Harford Community College	422
Howard Community College	264
Montgomery College	635
Prince George's Community College	364
Wor-Wic Community College	245

Table 6. Number of Dually Enrolled 12th Grade Students by College Dually Enrolled for 4-Year Public Institutions (Academic Year 2014-2015)

4-Year Public Institution	Dually Enrolled 12 th Grade Students <i>N</i>
Bowie State University	72
Coppin State University	41
Frostburg State University	71
Morgan State University	11
St Mary's College of Maryland	32
Salisbury University	≤ 10
Towson University	15
University of Baltimore	≤ 10
University of Maryland - Baltimore	≤ 10
University of Maryland - Baltimore County	69
University of Maryland - College Park	61
University of Maryland - University College	11
University of Maryland - Eastern Shore	41

Dual Enrollment Course Information

Twenty-nine percent of Maryland's dually enrolled students in academic year 2014-2015 had dual enrollment course information reported from the MSDE (see Table 7). Dual enrollment course information is only provided by the MSDE for students who participate in dual enrollment through a partnership agreement between the high school district and the institution of higher education. Thus, course information for students taking dual enrollment coursework through other arrangements, such as enrolling in coursework at a local college on their own, would not be included in this report. Additionally, the reporting of dual enrollment courses by the public high school districts is a relatively new requirement (required as of 2012) and is expected to improve over time. The percentage of dually enrolled students with course information varied by high school district and ranged from $\leq 10\%$ to $\geq 90\%$ of dually enrolled students⁶ having dual enrollment course information. This variation indicated differential reporting and/or classification of dually enrolled students' course information across high school districts.

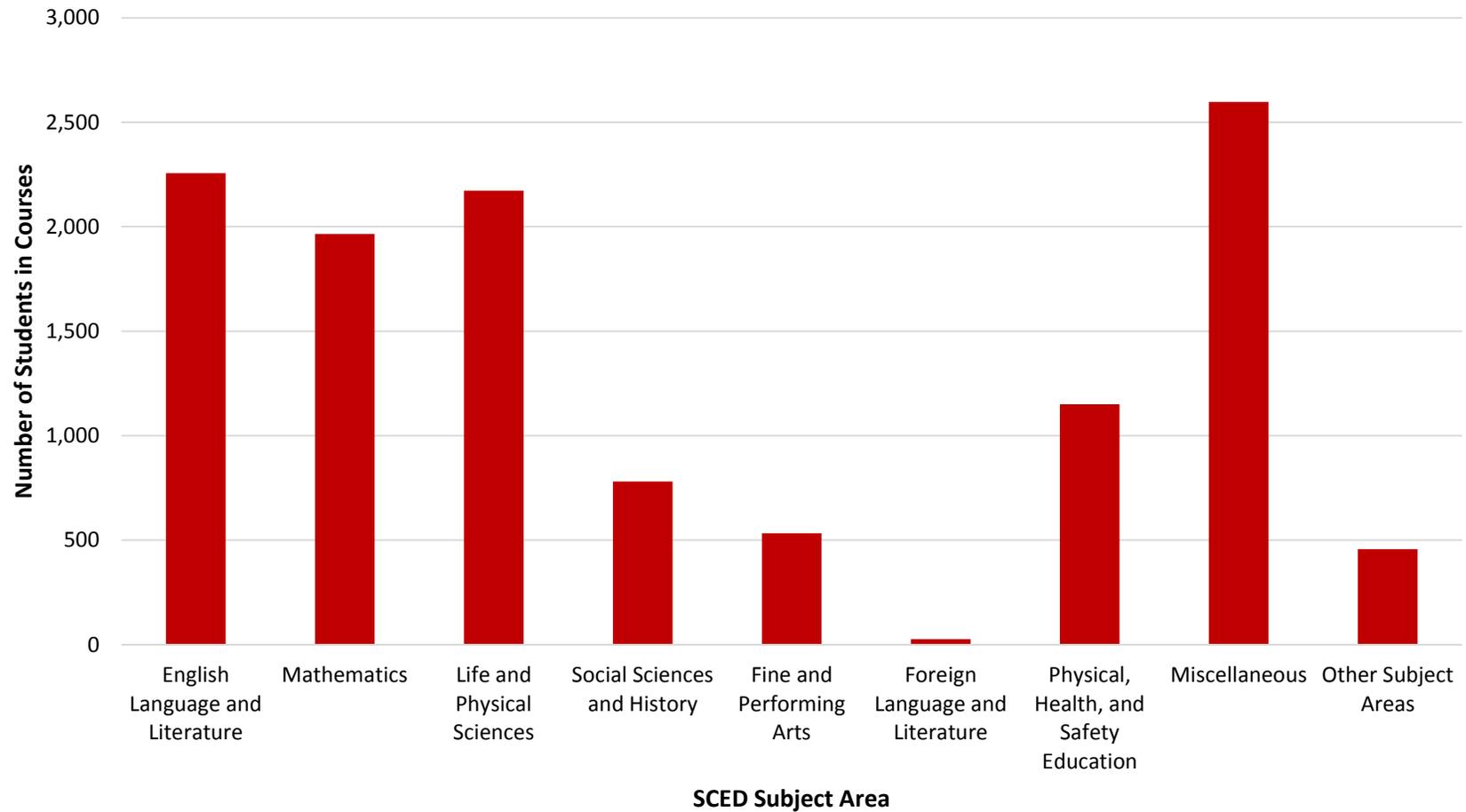
The largest number of dual enrollment courses taken by dually enrolled students were classified as miscellaneous ($N = 2,597$) using the SCED classification system (see Figure 10). Examples of courses classified as miscellaneous included independent study, career technical education (CTE)-career development, preparation, and transition, and study skills. The next largest number of dual enrollment courses taken by dually enrolled students were classified as English language and literature ($N = 2,256$), followed by life and physical sciences ($N = 2,173$), and mathematics ($N = 1,965$). Table 8 displays the dual enrollment course information for 2014-2015 dually enrolled students by SCED subject area and high school district. The number of dual enrollment courses taken by dually enrolled students in each SCED classification varied by high school district. A list of the SCED course numbers, names, and subject areas for all dually enrolled courses by high school district can be found in Appendix B. Some of the variation by high school district may be due to course offerings available in the district and variations in high school district reporting of course information.

Table 7. Percentage of 2014-2015 Dually Enrolled Students (All Grades) with Dual Enrollment Course Information by District

	%
Maryland	29
District	
Allegany	≥ 90
Anne Arundel	≤ 10
Baltimore City	≤ 10
Baltimore County	36
Calvert	≤ 10
Caroline	≥ 90
Carroll	74
Cecil	63
Charles	58
Dorchester	72
Frederick	45
Garrett	48
Harford	≤ 10
Howard	13
Kent	≥ 75
Montgomery	≤ 10
Prince George's	45
Queen Anne's	79
Somerset	≥ 75
St. Mary's	≤ 10
Talbot	≥ 85
Washington	3
Wicomico	72
Worcester	40

⁶ Percentages were suppressed where calculations could generate a number less than or equal to 10.

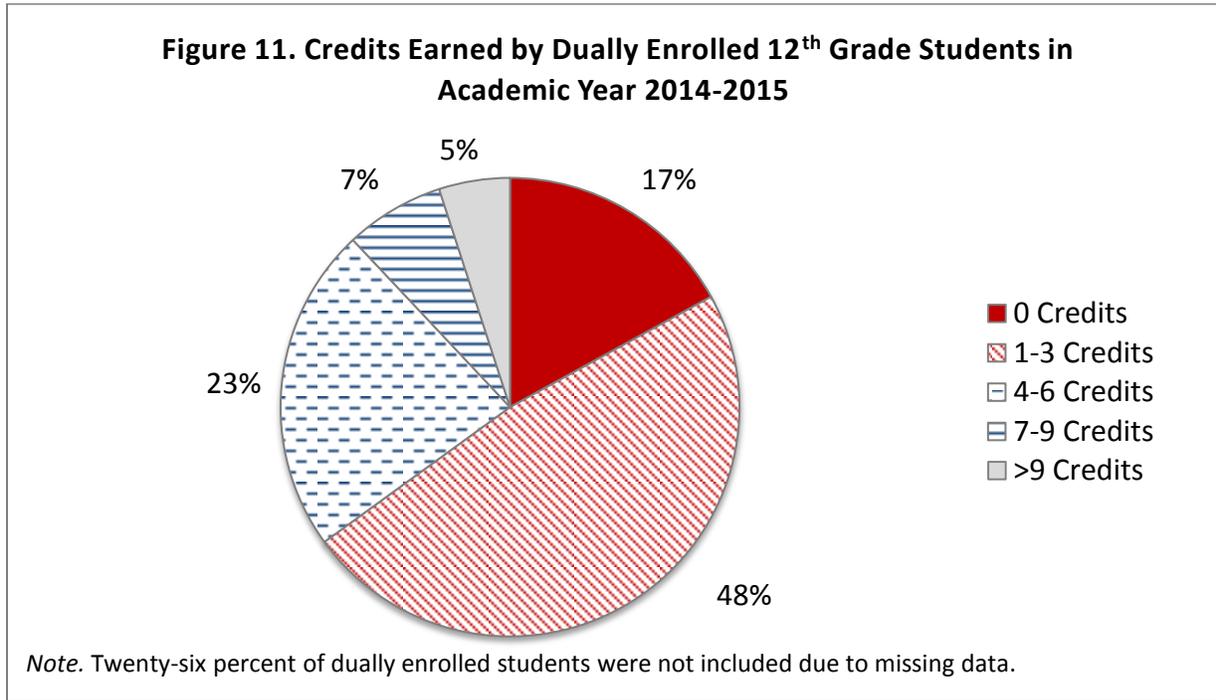
Figure 10. Course Information for 2014-2015 Dually Enrolled Students (All Grades) by School Courses for the Exchange of Data (SCED) Subject Area



	English Language and Lit	Math	Life and Physical Sciences	Social Sciences and History	Fine and Performing Arts	Foreign Language and Lit	Physical, Health, and Safety Ed	Misc.	Other Subject Areas
Maryland Total	2,256	1,965	2,173	780	533	27	1,150	2,597	457
Allegany	258	145	126	150	102	16	64	46	*
Anne Arundel	*	*	*	*	*	*	*	*	*
Baltimore City	*	*	*	*	*	*	*	12	*
Baltimore County	*	*	*	*	*	*	*	756	*
Calvert	*	*	*	*	*	*	*	*	*
Caroline	*	*	*	*	*	*	*	232	*
Carroll	70	34	16	*	*	*	*	192	*
Cecil	*	43	17	69	13	*	*	*	*
Charles	*	160	*	*	*	*	*	*	*
Dorchester	*	*	*	*	*	*	*	80	*
Frederick	330	86	29	70	*	*	*	*	*
Garrett	24	*	*	*	*	*	*	*	*
Harford	*	*	*	*	*	*	*	*	*
Howard	*	*	*	*	*	*	*	*	*
Kent	*	31	*	14	*	*	*	*	*
Montgomery	*	*	*	*	*	*	*	*	*
Prince George's	1,346	1,344	1,850	322	379	*	1,076	1,005	*
Queen Anne's	28	13	*	45	17	*	*	111	*
Somerset	29	*	19	*	*	*	*	*	*
St. Mary's	*	*	*	*	*	*	*	*	*
Talbot	46	19	15	12	*	*	*	161	*
Washington	14	19	42	*	*	*	*	*	*
Wicomico	71	49	32	89	*	*	*	*	*
Worcester	26	12	25	*	*	*	*	*	*

Notes. SCED = School Courses for the Exchange of Data; Misc. = miscellaneous; * = number is less than or equal to 10 and may be 0.

The largest percentage of dually enrolled 12th grade students⁷ in academic year 2014-2015 had earned 1-3 college credits by the end of the 2014-2015 academic year (48%; see Figure 11). Twenty-three percent of dually enrolled 12th grade students had earned 4-6 credits, 7% had earned 7-9 credits, and 5% had earned more than 9 credits by the end of the 2014-2015 academic year. Seventeen percent of dually enrolled 12th grade students had earned 0 credits by the end of the 2014-2015 academic year.



College Enrollment Outcomes

Eighty-nine percent of dually enrolled 12th grade students in academic year 2013-2014 enrolled in a college in the following academic year (see Table 9). The percentage of dually enrolled 12th grade students who enrolled in college within one year (89%) was higher than the percentage of total Maryland 12th grade students who enrolled in college within one year (64%). This result should be interpreted with caution because a greater percentage of dually enrolled students were female, white, and not eligible for FARMs (see Table 4), all characteristics associated with greater likelihood of enrolling in college.

⁷ Twenty-six percent of dually enrolled students had missing data for the credits earned variable. The credits earned variable was obtained from the Maryland Higher Education Commission (MHEC) and was collected in the Enrollment Information System (EIS) and End-of-Term System (EOTS) data collections. The percentages presented here were the percentages of dually enrolled 12th grade students in academic year 2014-2015 with non-missing information on the credits earned variable.

Table 9. Percentage of Dually Enrolled 12th Grade Students (2013-2014) Enrolled in College One Year Later (2014-2015) in Comparison to the Maryland 12th Grade Population by District

	Total 12 th	Dually Enrolled 12 th
	%	%
Maryland	64	89
District		
Allegany	51	≥ 85
Anne Arundel	66	83
Baltimore City	42	80
Baltimore County	65	91
Calvert	66	89
Caroline	47	≥80
Carroll	69	89
Cecil	54	89
Charles	65	≥85
Dorchester	42	≥65
Frederick	71	95
Garrett	61	≥75
Harford	71	84
Howard	82	92
Kent	45	≥50
Montgomery	76	93
Prince George's	55	95
Queen Anne's	64	≥85
Somerset	50	*
St. Mary's	58	93
Talbot	62	≥80
Washington	54	84
Wicomico	56	≥85
Worcester	61	≥85

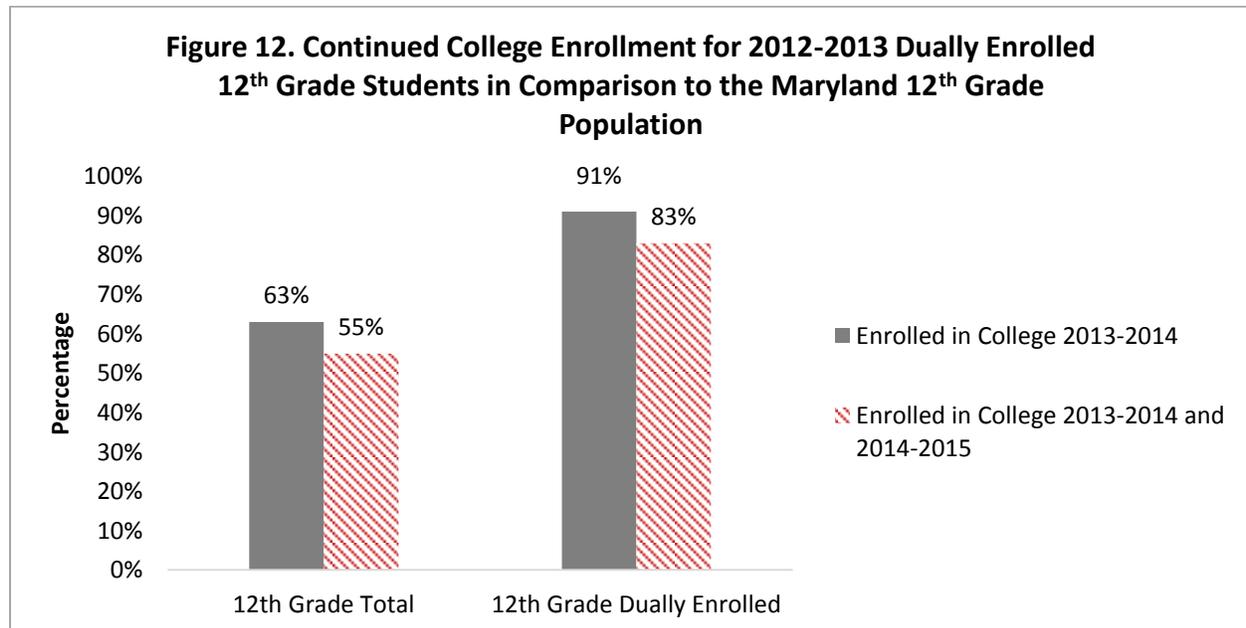
Note. Percentages were suppressed where calculations could generate a number less than or equal to 10. * was used to indicate a cell size that could not be reported due to size and/or uniqueness of the population.

The largest percentage of 2013-2014 dually enrolled 12th grade students who enrolled in college within one year enrolled in 2-year public institutions (47%; see Table 10). The percentage of dually enrolled 12th grade students who enrolled in an out-of-state college within one year (22%) was smaller than the percentage of the total 12th grade population of Maryland students who enrolled in an out-of-state college within one year (28%).

Table 10. College Type of Dually Enrolled 12th Grade Students (2013-2014) Enrolled in College One Year Later (2014-2015) in Comparison to the Maryland 12th Grade Population		
	Total 12 th	Dually Enrolled 12 th
	%	%
Out-of-State	28	22
2-Year Public	44	47
4-Year Public	24	27
4-Year Private	4	5

Note. Percentages may not add to 100 due to rounding.

In order to examine retention in college, the college enrollment outcomes of the 2012-2013 cohort of 12th grade students were examined after one (2013-2014) and two years (2014-2015) to measure the percentage of students who initially enrolled in college and were retained in the second year, respectively (see Figure 12). Among the 2012-2013 cohort, students who were dually enrolled in the 12th grade year were compared to the overall 12th grade population. A larger percentage of dually enrolled 12th grade students in academic year 2012-2013 (91%) enrolled in college within one year when compared to the Maryland population of 12th grade students (63%). Eighty-three percent of dually enrolled 12th grade students in academic year 2012-2013 were enrolled in college in 2013-2014 and were also retained in 2014-2015. This percentage was larger than the percentage of the total 12th grade population of students who were enrolled in college in both 2013-2014 and 2014-2015 (55%). Again, this result should be interpreted with caution because a greater percentage of dually enrolled students were female, white, and not eligible for FARMs (see Table 4), all characteristics associated with greater likelihood of enrolling in college. The percentage of students enrolled in college dropped 8 percentage points from the 2013-2014 to the 2014-2015 academic year for dually enrolled 12th grade students and the population of Maryland 12th grade students.



Summary of Findings

A total of 9,058 Maryland public high school students were dually enrolled in the 2014-2015 academic year. The total number of Maryland public high school students who were dually enrolled greatly increased between the 2013-2014 and 2014-2015 academic years. The majority of dually enrolled students were 12th grade students. The percentage of dually enrolled students who were 11th grade students greatly increased between 2013-2014 and 2014-2015. Eleven percent of the total 12th grade population of Maryland public high school students were dually enrolled in 2014-2015, and this percentage varied across high school districts. The majority of 12th grade dually enrolled students were female, white, non-Hispanic, and not eligible for FARMs. The percentage of dually enrolled students who were Black, Hispanic, and eligible for FARMs increased between 2013-2014 and 2014-2015. The majority of dually enrolled students were dually enrolled in 2-year public institutions.

Twenty-nine percent of Maryland dually enrolled students in academic year 2014-2015 had dual enrollment course information available and this percentage varied by high school district. The largest number of dual enrollment courses taken by dually enrolled students was classified as miscellaneous using the SCED classification system, followed by English language and literature, life and physical sciences, and mathematics. The largest percentage of dually enrolled 12th grade students in academic year 2014-2015 had earned 1-3 college credits by the end of the 2014-2015 academic year.

Eighty-nine percent of dually enrolled 12th grade students in academic year 2013-2014 enrolled in a college in the following academic year. The percentage of dually enrolled 12th grade students who enrolled in college within one year was higher than the percentage of total Maryland 12th grade students who enrolled in college within one year. Eighty-three percent of dually enrolled 12th grade students in academic year 2012-2013 were enrolled in college in academic year 2013-2014 and were retained in college in academic year 2014-2015. The percentage of dually enrolled 12th grade students who were enrolled in college in both 2013-2014 and 2014-2015 was larger than the percentage of the total 12th grade population who were enrolled in college in both 2013-2014 and 2014-2015. The college enrollment outcome information should be interpreted with caution because a greater percentage of dually enrolled students were female, white, and not eligible for FARMs, all characteristics associated with greater likelihood of enrolling in college.

Discussion

The findings of this report can be compared to the information presented in Tables 1 and 2 to compare the findings on dually enrolled students in Maryland to other states. Eleven percent of the Maryland 12th grade population was dually enrolled in academic year 2014-2015. Iowa was the state with the highest reported 12th grade dual enrollment percentage reported for 2014-2015 (50%; Iowa Department of Education, n.d.; see Table 1). Additionally, comparatively low percentages of Maryland students in lower grade levels (9th—11th) were dually enrolled in academic year 2014-2015. However, the percentage of Maryland students

dually enrolled in lower grade levels, especially 11th grade, increased between 2013-2014 and 2014-2015.

The most popular SCED classification for dually enrolled coursework in Maryland was miscellaneous, which included independent study, career technical education (CTE)-career development, preparation, and transition, and study skills. The miscellaneous category was followed by English language and literature, life and physical sciences, and mathematics. This finding is consistent with prior reporting of dual enrollment courses nationally and in other states. Thomas et al. (2013) reported that in a nationally representative sample of public high schools, large percentages of schools had students enrolled in dual credit courses with an academic focus and a vocational focus. Additionally, consistent with the findings in Maryland, of the three states that reported course information for dually enrolled students (see Table 2), two states (Iowa and New Mexico) reported that English language and literature was the most popular course subject in which dually enrolled students were enrolled (Iowa Department of Education, n.d.; New Mexico Public Education Department, 2015).

Consistent with prior research on the positive college enrollment outcomes associated with participation in dual enrollment (An, 2013; Karp et al., 2007; Henneberger et al., 2015), we found that dually enrolled 12th grade students in Maryland were more likely to enroll in college in the academic year following graduation when compared to the population of Maryland 12th grade students. The findings on college enrollment outcomes in Maryland provide initial evidence for the positive outcomes associated with dual enrollment participation in the State. However, variables that were not used as controls in the model, such as gender, race, ethnicity, and high school achievement, may be contributing to the positive association between dual enrollment participation and college enrollment outcomes. Thus, findings should be interpreted with caution, and more research is needed to examine dual enrollment participation after controlling for important differences between students who participate in dual enrollment and students who do not participate in dual enrollment.

Future Research

Future research on dual enrollment in Maryland using data from the MLDS will expand on the current report in a number of important ways. First, with more nuanced course information at the high school and college levels, we will be able to examine trends over time in course taking for dually enrolled students. Second, with additional years of longitudinal data, we will be able to examine longer-term outcomes for dually enrolled students, including college degrees earned and time to degree. Third, future research on dual enrollment will examine the high school correlates associated with dual enrollment, including course taking patterns, high school attendance, and test scores. Finally, future research on dual enrollment will focus on using dual enrollment to predict college outcomes after controlling for student demographic characteristics and high school correlates. This research will offer information about how well dual enrollment predicts college outcomes after accounting for variables known to be associated with college outcomes (e.g., gender, eligibility for FARMs, high school test scores).

Conclusion

This report examined the rates and trends in dual enrollment, the courses in which students were dually enrolled, and the college enrollment outcomes of dually enrolled students in Maryland. The analyses of this report indicated a large increase in the number and percentage of students dually enrolled between 2013-2014 and 2014-2015. The majority of dually enrolled students were female, white, non-Hispanic, and not eligible for FARMs. This dual enrollment report is the first report published by the MLDSC to include course information taken by dually enrolled students. The most popular SCED classification for courses taken by dually enrolled students was miscellaneous, followed by English language and literature, life and physical sciences, and mathematics. A larger percentage of dually enrolled 12th grade students enrolled in college within one academic year when compared to the percentage of the total 12th grade population enrolling in college within one academic year. Future reporting on dual enrollment in Maryland will provide more detailed information on courses taken by dually enrolled students and the college outcomes associated with dual enrollment participation, including examination of the association between dual enrollment participation and college outcomes after controlling for student demographic characteristics and high school achievement. Overall, the findings of this report indicate a positive upward trend in the number and percentage of dually enrolled students in Maryland. The findings also highlight the importance of continued focus on student involvement in dual enrollment, particularly students currently under-represented in the dually enrolled population, such as male students, minority students, and students eligible for FARMs.

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Appendix A

Table A.1. Overlap of Dually Enrolled Students Identified Using Overlapping Enrollment Dates (Grades 9-12) and the MHEC Flag by Academic Year		
	2013-2014	2014-2015
	<i>N</i>	<i>N</i>
Overlapping Enrollment Dates	6,156	9,058
MHEC Flag	5,702	8,885
Identified Using Both Methods	3,954	6,738
Identified Using Either Method	7,904	11,205

Appendix B

Table B.1. School Courses for the Exchange of Data (SCED) Course Numbers, Names, and Subject Areas for All Dually Enrolled Courses by District			
District	SCED Code	SCED Subject Area Name	SCED Course Name
Allegany	01001	English Language and Literature	ENGLISH/LANGUAGE ARTS I (9TH GRADE)
Allegany	01002	English Language and Literature	ENGLISH/LANGUAGE ARTS II (10TH GRADE)
Allegany	01003	English Language and Literature	ENGLISH/LANGUAGE ARTS III (11TH GRADE)
Allegany	01004	English Language and Literature	ENGLISH/LANGUAGE ARTS IV (12TH GRADE)
Allegany	01005	English Language and Literature	AP ENGLISH LANGUAGE AND COMPOSITION
Allegany	01006	English Language and Literature	AP ENGLISH LITERATURE AND COMPOSITION
Allegany	01054	English Language and Literature	AMERICAN LITERATURE
Allegany	01068	English Language and Literature	CORRECTIVE READING
Allegany	01102	English Language and Literature	ENGLISH/COMPOSITION (JUNIORS AND SENIORS)
Allegany	01151	English Language and Literature	PUBLIC SPEAKING
Allegany	01155	English Language and Literature	COMMUNICATIONS
Allegany	01203	English Language and Literature	ENGLISH—TEST PREPARATION
Allegany	02051	Mathematics	PRE-ALGEBRA
Allegany	02052	Mathematics	ALGEBRA I
Allegany	02055	Mathematics	TRANSITION ALGEBRA
Allegany	02056	Mathematics	ALGEBRA II
Allegany	02069	Mathematics	ALGEBRA—OTHER
Allegany	02072	Mathematics	GEOMETRY
Allegany	02102	Mathematics	DISCRETE MATHEMATICS
Allegany	02103	Mathematics	TRIGONOMETRY
Allegany	02110	Mathematics	PRE-CALCULUS
Allegany	02121	Mathematics	CALCULUS
Allegany	02124	Mathematics	AP CALCULUS AB
Allegany	02201	Mathematics	PROBABILITY AND STATISTICS
Allegany	02203	Mathematics	AP STATISTICS

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Allegany	02209	Mathematics	PROBABILITY AND STATISTICS—OTHER
Allegany	03001	Life and Physical Sciences	EARTH SCIENCE
Allegany	03003	Life and Physical Sciences	ENVIRONMENTAL SCIENCE
Allegany	03051	Life and Physical Sciences	BIOLOGY
Allegany	03052	Life and Physical Sciences	BIOLOGY—ADVANCED STUDIES
Allegany	03053	Life and Physical Sciences	ANATOMY AND PHYSIOLOGY
Allegany	03056	Life and Physical Sciences	AP BIOLOGY
Allegany	03059	Life and Physical Sciences	GENETICS
Allegany	03106	Life and Physical Sciences	AP CHEMISTRY
Allegany	03155	Life and Physical Sciences	AP PHYSICS B
Allegany	03207	Life and Physical Sciences	AP ENVIRONMENTAL SCIENCE
Allegany	04004	Social Sciences and History	AP HUMAN GEOGRAPHY
Allegany	04053	Social Sciences and History	MODERN WORLD HISTORY
Allegany	04057	Social Sciences and History	AP WORLD HISTORY
Allegany	04064	Social Sciences and History	CONTEMPORARY WORLD ISSUES
Allegany	04101	Social Sciences and History	U.S. HISTORY—COMPREHENSIVE
Allegany	04104	Social Sciences and History	AP U.S. HISTORY
Allegany	04149	Social Sciences and History	U.S. HISTORY—OTHER
Allegany	04151	Social Sciences and History	U.S. GOVERNMENT—COMPREHENSIVE
Allegany	04157	Social Sciences and History	AP U.S. GOVERNMENT AND POLITICS
Allegany	04201	Social Sciences and History	ECONOMICS
Allegany	04254	Social Sciences and History	PSYCHOLOGY
Allegany	04256	Social Sciences and History	AP PSYCHOLOGY
Allegany	04261	Social Sciences and History	SOCIAL SCIENCE RESEARCH
Allegany	05049	Fine and Performing Arts	DANCE—OTHER
Allegany	05053	Fine and Performing Arts	THEATER—COMPREHENSIVE
Allegany	05101	Fine and Performing Arts	GENERAL BAND
Allegany	05104	Fine and Performing Arts	ORCHESTRA
Allegany	05106	Fine and Performing Arts	SMALL ENSEMBLE
Allegany	05110	Fine and Performing Arts	CHORUS

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Allegany	05111	Fine and Performing Arts	VOCAL ENSEMBLE
Allegany	05113	Fine and Performing Arts	MUSIC THEORY
Allegany	05118	Fine and Performing Arts	MUSIC APPRECIATION
Allegany	05154	Fine and Performing Arts	VISUAL ART—COMPREHENSIVE
Allegany	06102	Foreign Language and Literature	SPANISH II
Allegany	06103	Foreign Language and Literature	SPANISH III
Allegany	06104	Foreign Language and Literature	SPANISH IV
Allegany	06105	Foreign Language and Literature	SPANISH V
Allegany	06112	Foreign Language and Literature	AP SPANISH LANGUAGE AND CULTURE
Allegany	06125	Foreign Language and Literature	FRENCH V
Allegany	08001	Physical, Health, and Safety Education	PHYSICAL EDUCATION
Allegany	08005	Physical, Health, and Safety Education	FITNESS/CONDITIONING ACTIVITIES
Allegany	08016	Physical, Health, and Safety Education	LIFETIME FITNESS EDUCATION
Allegany	08051	Physical, Health, and Safety Education	HEALTH EDUCATION
Allegany	08052	Physical, Health, and Safety Education	HEALTH AND FITNESS
Allegany	10008	Computer and Information Sciences	PARTICULAR TOPICS IN COMPUTER LITERACY
Allegany	10201	Computer and Information Sciences	WEB PAGE DESIGN
Allegany	10211	Computer and Information Sciences	CTE-PRINCIPALS OF ARTS, MEDIA AND COMMUNICATION
Allegany	10212	Computer and Information Sciences	CTE-INTERACTIVE MULTIMEDIA PRODUCTION
Allegany	10213	Computer and Information Sciences	CTE-ADVANCED INTERACTIVE MULTIMEDIA PRODUCTION
Allegany	11101	Communications and Audio/Visual Technology	JOURNALISM
Allegany	11103	Communications and Audio/Visual Technology	BROADCASTING TECHNOLOGY
Allegany	12005	Business and Marketing	KEYBOARDING
Allegany	12006	Business and Marketing	WORD PROCESSING
Allegany	12008	Business and Marketing	PARTICULAR TOPICS IN ADMINISTRATION
Allegany	12009	Business and Marketing	BUSINESS COMMUNICATIONS
Allegany	13002	Manufacturing	MANUFACTURING—COMPREHENSIVE
Allegany	13061	Manufacturing	CTE-THE COMPETITIVE MANUFACTURING ENTERPRISE
Allegany	13062	Manufacturing	CTE-PROCESS DESIGN AND DEVELOPMENT

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Allegany	15051	Public, Protective, and Government Service	CRIMINAL JUSTICE
Allegany	16054	Hospitality and Tourism	NUTRITION AND FOOD PREPARATION
Allegany	16056	Hospitality and Tourism	CULINARY ART SPECIALTY
Allegany	16057	Hospitality and Tourism	PARTICULAR TOPICS IN RESTAURANT, FOOD AND BEVERAGE SERVICES
Allegany	17001	Architecture and Construction	CONSTRUCTION CAREERS EXPLORATION
Allegany	17061	Architecture and Construction	CTE-FOUNDATIONS OF BUILDING AND CONSTRUCTION TECHNOLOGY
Allegany	19101	Human Services	COSMETOLOGY—LICENSING
Allegany	19112	Human Services	CTE-ADVANCED COSMETOLOGY: THEORY AND APPLICATION
Allegany	20116	Transportation, Distribution and Logistics	AUTOMOTIVE BODY REPAIR AND REFINISHING—COMPREHENSIVE
Allegany	20117	Transportation, Distribution and Logistics	PARTICULAR TOPICS IN AUTOMOTIVE BODY REPAIR AND REFINISHING
Allegany	21051	Engineering and Technology	TECHNOLOGICAL LITERACY
Allegany	21053	Engineering and Technology	EMERGING TECHNOLOGIES
Allegany	21056	Engineering and Technology	PARTICULAR TOPICS IN TECHNOLOGY APPLICATIONS
Allegany	22002	Miscellaneous	STATE TEST PREPARATION
Allegany	22162	Miscellaneous	CTE-CAREER DEVELOPMENT, PREPARATION, AND TRANSITION
Allegany	22208	Miscellaneous	FAMILY LIVING
Allegany	22999	Miscellaneous	MISCELLANEOUS—OTHER
Baltimore City	22999	Miscellaneous	MISCELLANEOUS—OTHER
Baltimore County	22997	Miscellaneous	MISCELLANEOUS—INDEPENDENT STUDY
Calvert	01004	English Language and Literature	ENGLISH/LANGUAGE ARTS IV (12TH GRADE)
Caroline	22999	Miscellaneous	MISCELLANEOUS—OTHER
Carroll	01004	English Language and Literature	ENGLISH/LANGUAGE ARTS IV (12TH GRADE)
Carroll	02999	Mathematics	MATHEMATICS—OTHER
Carroll	03101	Life and Physical Sciences	CHEMISTRY
Carroll	03201	Life and Physical Sciences	INTEGRATED SCIENCE
Carroll	03999	Life and Physical Sciences	LIFE AND PHYSICAL SCIENCES—OTHER
Carroll	05199	Fine and Performing Arts	VISUAL ARTS—OTHER
Carroll	06999	Foreign Language and Literature	FOREIGN LANGUAGE AND LITERATURE—OTHER

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Carroll	08051	Physical, Health, and Safety Education	HEALTH EDUCATION
Carroll	12055	Business and Marketing	BUSINESS PRINCIPLES AND MANAGEMENT
Carroll	12142	Business and Marketing	CTE-ADVANCED ACCOUNTING
Carroll	12169	Business and Marketing	SOCIAL MEDIA MARKETING
Carroll	12305	Business and Marketing	CTE-FINANCIAL PLANNING
Carroll	14261	Health Care Sciences	CTE-PRINCIPLES OF THE BIOMEDICAL SCIENCES
Carroll	14262	Health Care Sciences	CTE-HUMAN BODY SYSTEMS
Carroll	14263	Health Care Sciences	CTE-MEDICAL INTERVENTIONS
Carroll	14264	Health Care Sciences	CTE-BIOMEDICAL INNOVATION
Carroll	18012	Agriculture, Food, and Natural Resources	CTE-PRINCIPLES OF AGRICULTURAL SCIENCES- ANIMAL
Carroll	18014	Agriculture, Food, and Natural Resources	CTE-ANIMAL AND PLANT BIOTECHNOLOGY
Carroll	18016	Agriculture, Food, and Natural Resources	CTE-AGRICULTURAL BUSINESS, RESEARCH, AND DEVELOPMENT (CAPSTONE)
Carroll	21024	Engineering and Technology	CTE-PRINCIPLES OF ENGINEERING- MOVE TO 21018
Carroll	21026	Engineering and Technology	CTE-INTRODUCTION TO ENGINEERING DESIGN- MOVE TO 21017
Carroll	21028	Engineering and Technology	CTE-DIGITAL ELECTRONICS- MOVE TO 21023
Carroll	21030	Engineering and Technology	CTE-COMPUTER INTEGRATED MANUFACTURING- MOVE TO 21022
Carroll	22999	Miscellaneous	MISCELLANEOUS—OTHER
Cecil	01006	English Language and Literature	AP ENGLISH LITERATURE AND COMPOSITION
Cecil	02102	Mathematics	DISCRETE MATHEMATICS
Cecil	02111	Mathematics	LINEAR ALGEBRA
Cecil	02121	Mathematics	CALCULUS
Cecil	02122	Mathematics	MULTIVARIATE CALCULUS
Cecil	02123	Mathematics	DIFFERENTIAL CALCULUS
Cecil	02201	Mathematics	PROBABILITY AND STATISTICS
Cecil	02203	Mathematics	AP STATISTICS
Cecil	03001	Life and Physical Sciences	EARTH SCIENCE
Cecil	03004	Life and Physical Sciences	ASTRONOMY
Cecil	03005	Life and Physical Sciences	MARINE SCIENCE

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Cecil	03056	Life and Physical Sciences	AP BIOLOGY
Cecil	03099	Life and Physical Sciences	BIOLOGY—OTHER
Cecil	03106	Life and Physical Sciences	AP CHEMISTRY
Cecil	03151	Life and Physical Sciences	PHYSICS
Cecil	03155	Life and Physical Sciences	AP PHYSICS B
Cecil	03207	Life and Physical Sciences	AP ENVIRONMENTAL SCIENCE
Cecil	04004	Social Sciences and History	AP HUMAN GEOGRAPHY
Cecil	04157	Social Sciences and History	AP U.S. GOVERNMENT AND POLITICS
Cecil	04256	Social Sciences and History	AP PSYCHOLOGY
Cecil	04258	Social Sciences and History	SOCIOLOGY
Cecil	05114	Fine and Performing Arts	AP MUSIC THEORY
Cecil	05167	Fine and Performing Arts	PHOTOGRAPHY
Cecil	05168	Fine and Performing Arts	CINEMATOGRAPHY/VIDEO PRODUCTION
Cecil	05169	Fine and Performing Arts	MULTIMEDIA ART
Cecil	05172	Fine and Performing Arts	AP STUDIO ART—DRAWING
Cecil	10153	Computer and Information Sciences	VISUAL BASIC (VB) PROGRAMMING
Cecil	10154	Computer and Information Sciences	C++ PROGRAMMING
Cecil	10155	Computer and Information Sciences	JAVA PROGRAMMING
Cecil	10156	Computer and Information Sciences	COMPUTER PROGRAMMING—OTHER LANGUAGE
Cecil	12003	Business and Marketing	OFFICE AND ADMINISTRATIVE TECHNOLOGIES
Cecil	12051	Business and Marketing	INTRODUCTORY BUSINESS
Cecil	12055	Business and Marketing	BUSINESS PRINCIPLES AND MANAGEMENT
Cecil	12104	Business and Marketing	ACCOUNTING
Cecil	12164	Business and Marketing	PRINCIPLES OF MARKETING
Cecil	13207	Manufacturing	WELDING
Cecil	14002	Health Care Sciences	HEALTH CARE OCCUPATIONS—COMPREHENSIVE
Cecil	14263	Health Care Sciences	CTE-MEDICAL INTERVENTIONS
Cecil	16052	Hospitality and Tourism	RESTAURANT, FOOD AND BEVERAGE SERVICES—COMPREHENSIVE
Cecil	17002	Architecture and Construction	CONSTRUCTION—COMPREHENSIVE
Cecil	18002	Agriculture, Food, and Natural	AGRICULTURE—COMPREHENSIVE

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		Resources	
Cecil	19152	Human Services	EDUCATIONAL METHODOLOGY
Cecil	21004	Engineering and Technology	PRINCIPLES OF ENGINEERING
Cecil	21006	Engineering and Technology	ENGINEERING DESIGN
Cecil	21007	Engineering and Technology	ENGINEERING DESIGN AND DEVELOPMENT
Cecil	21008	Engineering and Technology	DIGITAL ELECTRONICS
Cecil	21012	Engineering and Technology	CIVIL ENGINEERING AND ARCHITECTURE
Cecil	21026	Engineering and Technology	CTE-INTRODUCTION TO ENGINEERING DESIGN- MOVE TO 21017
Cecil	21107	Engineering and Technology	CAD DESIGN AND SOFTWARE
Charles	02110	Mathematics	PRE-CALCULUS
Charles	21007	Engineering and Technology	ENGINEERING DESIGN AND DEVELOPMENT
Charles	21010	Engineering and Technology	COMPUTER INTEGRATED MANUFACTURING
Charles	21012	Engineering and Technology	CIVIL ENGINEERING AND ARCHITECTURE
Charles	21013	Engineering and Technology	AEROSPACE ENGINEERING
Dorchester	22999	Miscellaneous	MISCELLANEOUS—OTHER
Frederick	01003	English Language and Literature	ENGLISH/LANGUAGE ARTS III (11TH GRADE)
Frederick	01997	English Language and Literature	ENGLISH LANGUAGE AND LITERATURE—INDEPENDENT STUDY
Frederick	02121	Mathematics	CALCULUS
Frederick	02203	Mathematics	AP STATISTICS
Frederick	02997	Mathematics	MATHEMATICS—INDEPENDENT STUDY
Frederick	03097	Life and Physical Sciences	BIOLOGY—INDEPENDENT STUDY
Frederick	04254	Social Sciences and History	PSYCHOLOGY
Frederick	04258	Social Sciences and History	SOCIOLOGY
Frederick	04997	Social Sciences and History	SOCIAL SCIENCES AND HISTORY—INDEPENDENT STUDY
Garrett	01103	English Language and Literature	COMPOSITION
Garrett	02103	Mathematics	TRIGONOMETRY
Garrett	02202	Mathematics	INFERENCE PROBABILITY AND STATISTICS
Howard	10123	Computer and Information Sciences	CTE-CCNA DISCOVERY III: ROUTING AND SWITCHING IN THE ENTERPRISE
Howard	10129	Computer and Information Sciences	CTE-CYBERWATCH: SECURITY+ (CW160)
Howard	11056	Communications and Audio/Visual	PARTICULAR TOPICS IN AUDIO/VIDEO TECHNOLOGY AND FILM

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		Technology	
Howard	11161	Communications and Audio/Visual Technology	CTE-INTRODUCTION TO GRAPHIC COMMUNICATIONS
Howard	11167	Communications and Audio/Visual Technology	CTE- SCREEN PRINTING
Howard	11999	Communications and Audio/Visual Technology	COMMUNICATION AND AUDIO/VIDEO TECHNOLOGY—OTHER 1199
Howard	12103	Business and Marketing	FINANCE
Howard	12149	Business and Marketing	FINANCE—OTHER
Howard	14071	Health Care Sciences	CTE-FOUNDATIONS OF MEDICINE AND HEALTH SCIENCE
Howard	14072	Health Care Sciences	CTE-STRUCTURE AND FUNCTIONS OF THE HUMAN BODY
Howard	14077	Health Care Sciences	CTE-AHP ALLIED HEALTH INTERNSHIP
Howard	14248	Health Care Sciences	HEALTH SUPPORT SERVICES—WORKPLACE EXPERIENCE
Howard	14299	Health Care Sciences	HEALTH SCIENCES—OTHER
Howard	15111	Public, Protective, and Government Service	CTE-FOUNDATIONS OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS
Howard	15116	Public, Protective, and Government Service	CTE-S.T.A.R.S. COURSE 1 – INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING
Howard	15118	Public, Protective, and Government Service	CTE-S.T.A.R.S. COURSE 3 – ADVANCED SKILL-BASED TRAINING FOR GEOGRAPHIC INFORMATION SYSTEMS AND REMOTE SENSING
Howard	15120	Public, Protective, and Government Service	CTE-INTERNSHIP/CAPSTONE EXPERIENCE/DUAL ENROLLMENT
Howard	15161	Public, Protective, and Government Service	CTE-EMERGENCY MEDICAL TECHNICIAN – BASIC
Howard	16111	Hospitality and Tourism	CTE-PRINCIPLES OF HOSPITALITY AND TOURISM
Howard	16112	Hospitality and Tourism	CTE-HOSPITALITY AND TOURISM MANAGEMENT
Howard	17998	Architecture and Construction	ARCHITECTURE AND CONSTRUCTION—WORKPLACE EXPERIENCE
Howard	17999	Architecture and Construction	ARCHITECTURE AND CONSTRUCTION—OTHER
Howard	20101	Transportation, Distribution and Logistics	ENERGY/POWER
Howard	20213	Transportation, Distribution and Logistics	CTE-ELECTRICAL/ELECTRONIC SYSTEMS
Kent	01058	English Language and Literature	WORLD LITERATURE
Kent	01131	English Language and Literature	WRITING (GRADE 1)

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Kent	02201	Mathematics	PROBABILITY AND STATISTICS
Kent	04153	Social Sciences and History	POLITICAL SCIENCE
Kent	04254	Social Sciences and History	PSYCHOLOGY
Kent	04302	Social Sciences and History	HUMANITIES
Kent	04306	Social Sciences and History	PHILOSOPHY
Kent	05099	Fine and Performing Arts	THEATER—OTHER
Kent	07002	Religious Education and Theology	COMPARATIVE RELIGION
Kent	08058	Physical, Health, and Safety Education	SUBSTANCE ABUSE PREVENTION
Kent	10001	Computer and Information Sciences	INTRODUCTION TO COMPUTER TECHNOLOGY
Kent	12104	Business and Marketing	ACCOUNTING
Kent	12105	Business and Marketing	BUSINESS ECONOMICS
Kent	15051	Public, Protective, and Government Service	CRIMINAL JUSTICE
Prince George's	01004	English Language and Literature	ENGLISH/LANGUAGE ARTS IV (12TH GRADE)
Prince George's	01155	English Language and Literature	COMMUNICATIONS
Prince George's	02058	Mathematics	PARTICULAR TOPICS IN ALGEBRA
Prince George's	02069	Mathematics	ALGEBRA—OTHER
Prince George's	02105	Mathematics	TRIGONOMETRY/MATH ANALYSIS
Prince George's	02110	Mathematics	PRE-CALCULUS
Prince George's	02121	Mathematics	CALCULUS
Prince George's	02201	Mathematics	PROBABILITY AND STATISTICS
Prince George's	03051	Life and Physical Sciences	BIOLOGY
Prince George's	03053	Life and Physical Sciences	ANATOMY AND PHYSIOLOGY
Prince George's	03060	Life and Physical Sciences	MICROBIOLOGY
Prince George's	03099	Life and Physical Sciences	BIOLOGY—OTHER
Prince George's	04254	Social Sciences and History	PSYCHOLOGY
Prince George's	04258	Social Sciences and History	SOCIOLOGY
Prince George's	05199	Fine and Performing Arts	VISUAL ARTS—OTHER
Prince George's	08001	Physical, Health, and Safety Education	PHYSICAL EDUCATION
Prince George's	08051	Physical, Health, and Safety Education	HEALTH EDUCATION

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Prince George's	22003	Miscellaneous	STUDY SKILLS
Prince George's	22999	Miscellaneous	MISCELLANEOUS—OTHER
Queen Anne's	01066	English Language and Literature	STRATEGIC READING
Queen Anne's	01068	English Language and Literature	CORRECTIVE READING
Queen Anne's	01131	English Language and Literature	WRITING (GRADE 1)
Queen Anne's	01992	English Language and Literature	ENGLISH PROFICIENCY DEVELOPMENT
Queen Anne's	02069	Mathematics	ALGEBRA—OTHER
Queen Anne's	02121	Mathematics	CALCULUS
Queen Anne's	02201	Mathematics	PROBABILITY AND STATISTICS
Queen Anne's	03051	Life and Physical Sciences	BIOLOGY
Queen Anne's	03151	Life and Physical Sciences	PHYSICS
Queen Anne's	04101	Social Sciences and History	U.S. HISTORY—COMPREHENSIVE
Queen Anne's	04203	Social Sciences and History	AP MICROECONOMICS
Queen Anne's	04254	Social Sciences and History	PSYCHOLOGY
Queen Anne's	04258	Social Sciences and History	SOCIOLOGY
Queen Anne's	05099	Fine and Performing Arts	THEATER—OTHER
Queen Anne's	05118	Fine and Performing Arts	MUSIC APPRECIATION
Queen Anne's	05119	Fine and Performing Arts	COMPOSITION/SONGWRITING
Queen Anne's	05169	Fine and Performing Arts	MULTIMEDIA ART
Queen Anne's	05181	Fine and Performing Arts	ART (GRADE 1)
Queen Anne's	08001	Physical, Health, and Safety Education	PHYSICAL EDUCATION
Queen Anne's	12011	Business and Marketing	CTE-OFFICE SYSTEMS MANAGEMENT II
Queen Anne's	12052	Business and Marketing	BUSINESS MANAGEMENT
Queen Anne's	12151	Business and Marketing	MARKETING CAREER EXPLORATION
Queen Anne's	14154	Health Care Sciences	MEDICAL TERMINOLOGY
Queen Anne's	22106	Miscellaneous	SEMINAR
Queen Anne's	22999	Miscellaneous	MISCELLANEOUS—OTHER
Somerset	01102	English Language and Literature	ENGLISH/COMPOSITION (JUNIORS AND SENIORS)
Somerset	03003	Life and Physical Sciences	ENVIRONMENTAL SCIENCE
Somerset	03101	Life and Physical Sciences	CHEMISTRY

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Talbot	01005	English Language and Literature	AP ENGLISH LANGUAGE AND COMPOSITION
Talbot	01006	English Language and Literature	AP ENGLISH LITERATURE AND COMPOSITION
Talbot	01068	English Language and Literature	CORRECTIVE READING
Talbot	02124	Mathematics	AP CALCULUS AB
Talbot	02125	Mathematics	AP CALCULUS BC
Talbot	02201	Mathematics	PROBABILITY AND STATISTICS
Talbot	03056	Life and Physical Sciences	AP BIOLOGY
Talbot	04004	Social Sciences and History	AP HUMAN GEOGRAPHY
Talbot	04159	Social Sciences and History	AP GOVERNMENT
Talbot	05174	Fine and Performing Arts	AP STUDIO ART—TWO-DIMENSIONAL
Talbot	06313	Foreign Language and Literature	AP LATIN (VIRGIL, CATULLUS AND HORACE)
Talbot	22999	Miscellaneous	MISCELLANEOUS—OTHER
Washington	01101	English Language and Literature	ENGLISH/COMPOSITION (FRESHMEN AND SOPHOMORES)
Washington	02069	Mathematics	ALGEBRA—OTHER
Washington	02110	Mathematics	PRE-CALCULUS
Washington	02121	Mathematics	CALCULUS
Washington	02126	Mathematics	PARTICULAR TOPICS IN CALCULUS
Washington	03051	Life and Physical Sciences	BIOLOGY
Washington	03053	Life and Physical Sciences	ANATOMY AND PHYSIOLOGY
Washington	03099	Life and Physical Sciences	BIOLOGY—OTHER
Washington	03101	Life and Physical Sciences	CHEMISTRY
Washington	03106	Life and Physical Sciences	AP CHEMISTRY
Washington	03210	Life and Physical Sciences	SCIENCE, TECHNOLOGY AND SOCIETY
Washington	04064	Social Sciences and History	CONTEMPORARY WORLD ISSUES
Washington	04151	Social Sciences and History	U.S. GOVERNMENT—COMPREHENSIVE
Washington	04254	Social Sciences and History	PSYCHOLOGY
Washington	05113	Fine and Performing Arts	MUSIC THEORY
Washington	05119	Fine and Performing Arts	COMPOSITION/SONGWRITING
Washington	05154	Fine and Performing Arts	VISUAL ART—COMPREHENSIVE
Washington	06999	Foreign Language and Literature	FOREIGN LANGUAGE AND LITERATURE—OTHER

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Washington	10101	Computer and Information Sciences	NETWORK TECHNOLOGY
Washington	10129	Computer and Information Sciences	CTE-CYBERWATCH: SECURITY+ (CW160)
Washington	10151	Computer and Information Sciences	BUSINESS PROGRAMMING
Washington	14251	Health Care Sciences	HEALTH SCIENCE
Washington	15051	Public, Protective, and Government Service	CRIMINAL JUSTICE
Washington	22106	Miscellaneous	SEMINAR
Wicomico	01004	English Language and Literature	ENGLISH/LANGUAGE ARTS IV (12TH GRADE)
Wicomico	01999	English Language and Literature	ENGLISH LANGUAGE AND LITERATURE—OTHER
Wicomico	02121	Mathematics	CALCULUS
Wicomico	02126	Mathematics	PARTICULAR TOPICS IN CALCULUS
Wicomico	02201	Mathematics	PROBABILITY AND STATISTICS
Wicomico	03099	Life and Physical Sciences	BIOLOGY—OTHER
Wicomico	03149	Life and Physical Sciences	CHEMISTRY—OTHER
Wicomico	03999	Life and Physical Sciences	LIFE AND PHYSICAL SCIENCES—OTHER
Wicomico	04062	Social Sciences and History	WORLD PEOPLE STUDIES
Wicomico	04254	Social Sciences and History	PSYCHOLOGY
Wicomico	05154	Fine and Performing Arts	VISUAL ART—COMPREHENSIVE
Worcester	01101	English Language and Literature	ENGLISH/COMPOSITION (FRESHMEN AND SOPHOMORES)
Worcester	01102	English Language and Literature	ENGLISH/COMPOSITION (JUNIORS AND SENIORS)
Worcester	02106	Mathematics	TRIGONOMETRY/ALGEBRA
Worcester	02204	Mathematics	PARTICULAR TOPICS IN PROBABILITY AND STATISTICS
Worcester	03001	Life and Physical Sciences	EARTH SCIENCE
Worcester	03101	Life and Physical Sciences	CHEMISTRY
Worcester	03156	Life and Physical Sciences	AP PHYSICS C

Note. Anne Arundel, Harford, Montgomery, and St. Mary's public school districts were not included in this table because they did not have any course names classified as dual enrollment courses.